

Case report

Acute bacterial meningitis as the cause of a traffic accident

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Abstract

This is a report about a traffic accident without an apparent external cause. The driver responsible for the accident was diagnosed with acute bacterial meningitis. From a forensic aspect the meningitis was determined as the underlying reason for the accident, but it could not be assumed that the driver should have recognized the danger in time.

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1. Introduction

There are numerous illnesses or impairments that can make it inexpedient or impossible to drive a motor vehicle. These are particularly relevant when a stable performance cannot be guaranteed or when there is danger that a driver may suddenly fail in his capability to drive, such as in the case of unconsciousness. Nevertheless, acute and chronic illnesses are deemed less significant for traffic safety than shortcomings of character, personality disorders, or substance dependence and abuse.¹

Particularly in instances where accidents are due to failings or incapacity caused by acute illness, the question of avoidability arises. In the following case of a car driver who had fallen ill with acute bacterial meningitis and was responsible for a motor vehicle accident, medico-legal experts had to address the question of whether or not the meningitis could have been the underlying cause of the accident. A further consideration was whether noticeable symptoms occurred prior to the accident that indicated the driver should cease driving.

2. Case report

On a Friday morning a 37-year-old construction worker started his approximately 200 km drive back home after a week-long shift on a construction site. After an approximate distance of 150 km and 1 h 45 min driving time, 10 witnesses observed how his car slowly, and without any apparent external reason, swerved into the opposite lane on a straight stretch of a busy highway where it collided head-on with a bus (Fig. 1).

Police officers noted that the driver of the car was responsive directly after the accident and showed only slight external injuries. However, he claimed to have no recollection of the accident or of the circumstances leading to it. He was then transported to a hospital for further diagnosis of possible internal injuries. On the way there his conscious level began to decline.

2.1. Physical findings on presentation

Good condition was documented with abrasions on the head and contusions on the left side of the chest. The state of consciousness was lethargic to somnolent. Orientation could not be tested. Cranial nerve function was normal, movement of extremities was equal for both sides without clearly defined pareses, weak muscular proprioceptive

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Fig. 1. Place of accident; the two involved vehicles in the foreground.

reflexes could be elicited equally for both sides and there were no pyramidal tract signs. Circulation parameters as well as auscultatory heart and lung values were normal. The abdominal sonography showed no free fluid. The body temperature was 38.9 °C and a pronounced nuchal rigidity was observed.

2.2. Radiological findings

The computer tomography of the cranium and the vertebral column was normal, as was a subsequent nuclear magnetic resonance tomography (NMR) of the brain.

2.3. Laboratory tests

A blood sample taken upon admittance to hospital revealed leucocytosis (22,000 leuco/ μ l) as well as a CRP (C-reactive protein) level of 2.1 mg/dl with otherwise inconspicuous parameters.

2.4. Lumbar puncture

After exclusion of an intracranial injury, a lumbar puncture was done with the patient showing further declining consciousness, a raised temperature and pronounced nuchal rigidity. This yielded a purulent liquor which showed both clearly raised cell counts (1500/ μ l) and protein values (2.5 g/l). Bacteriological culture demonstrated the growth of *Haemophilus influenzae*.

2.5. Therapy and progress

After bacterial meningitis was diagnosed, intravenous therapy with 4 g Ceftriaxon and 3×10 mU of Penicillin G was started, on the day of admission to hospital. Based on the results from the liquor culture, Penicillin G was replaced by Ceftriaxon from the third day and continued for a further 7 days. From the sixth day the patient was afebrile and neurologically normal. The amnesia in respect to the accident remained and his memory ended shortly after the journey home began. The driver claims to have felt slight flu-like symptoms at that point.

2.6. Notification requirement

The law for the protection against infectious diseases in the Federal Republic of Germany² demands notification by name to the responsible health authorities not only in cases in which *Haemophilus influenzae* can be directly demonstrated in blood or liquor cultures, also in cases of suspected meningococcal meningitis. In the current case, the responsible health authorities were notified twice: once immediately after the lumbar puncture was done on suspicion of a meningococcal meningitis, and a second time following the demonstration of *Haemophilus influenzae*. All persons who had come into contact with the patient on the construction site, as well as first-aid helpers and medical rescue personnel from the site of the accident, were examined. All tested negative for an infection.

3. Discussion

A case in which acute meningitis was the underlying cause for a traffic accident had not previously been published. Typical symptoms described in the literature for meningitis are fever, headache, meningism and signs of cerebral dysfunction (confusion, delirium, or declining consciousness), although it appears none of these symptoms must necessarily be present.^{3,4} A study by Durand et al. (“Acute bacterial meningitis in adults”) in 1993 evaluated the data from 445 patients.⁵ The clinical triad of fever, nuchal rigidity and change in mental status was present in only two-thirds of the patients, but all had at least one of these findings. Most of the patients were neurologically impaired: 51% were confused or lethargic, 22% were responsive only to pain and 6 percent were unresponsive to all stimuli. However, 22% were normally alert. On presentation or during the first 24 h, 29% of patients had focal seizures or focal neurological findings that were not present before the onset of meningitis.

It can, therefore, be assumed that impaired consciousness can occur in the course of meningitis and this, in turn, can lead to impairment in performance. The question whether acute meningitis could, in this case, have been the underlying cause of the accident must, therefore, be answered in the affirmative.

A more difficult question to answer is whether symptoms may have occurred prior to the accident that could have induced the driver to break off his journey. Specific references as to how fast symptoms of meningitis can develop from being asymptomatic or suffering minor malaise could not be found in the literature. The driver in the presented case felt flu-like symptoms but how far these

may have increased in gravity in the course of the journey can no longer be ascertained due to amnesia. Amnesia could have been caused by meningitis and/or injury from the road traffic accident. Even if the symptoms did increase in severity, it is unlikely that the driver would, as a medical lay-person, have been able to associate these to a serious, and possibly to him unknown, illness and to recognize an impending loss of his driving capability.

On the other hand, and irrespective of all feelings of illness, it must be assumed that sudden unconsciousness through an epileptic seizure could have occurred at any time. Accordingly, it is not certain whether the driver noticed any symptoms prior to the accident that could have led him to consider a serious illness and to stop driving.

The presented case demonstrates that an acute bacterial meningitis can have forensic relevance as a possible cause of an accident. It cannot necessarily be assumed that a driver who has become ill must be able to recognize the potential danger in time.

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